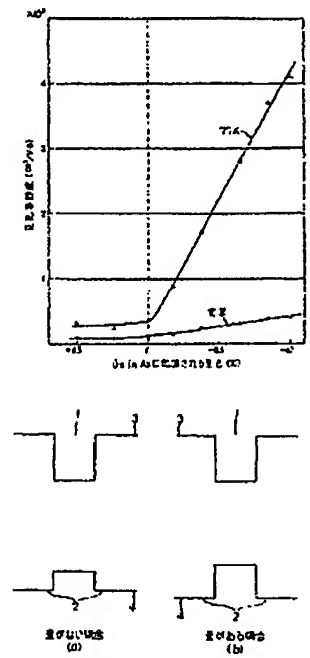
EUROPEAN PATENT OFFICE

Patent Abstracts of Japan



PUBLICATION NUMBER : 63051678
PUBLICATION DATE : 04-03-88

APPLICATION DATE : 20-08-86
APPLICATION NUMBER : 61196083

APPLICANT : NEC CORP;

INVENTOR : MIZUTANI TAKASHI;

INT.CL. : H01L 29/80 H01L 21/20 H01L 29/165 H01L 29/205

TITLE : SEMICONDUCTOR DEVICE

ABSTRACT : PURPOSE: To increase hole mobility by a method wherein a valence band discontinuous quantity in a single-quantum well structure is rendered to be larger than in a well free of strain for a reduction in the hole effective mass.

CONSTITUTION: This design aims to increase the mobility of a hole in a semiconductor by a method wherein a valence band discontinuous quantity corresponding to a heavy hole between semiconductors constituting a single-quantum well structure is supplied with strain in said well structure. For example, on a high- resistance InP (100), a single-quantum well structure is grown, composed of $Ga_xIn_{1-x}As$ and $Al_yIn_{1-y}As$. Then, the strain supplied to the $Ga_xIn_{1-x}As$ is caused to change. The mobility of a hole, when the quantity of supplied strain ε is negative (compression strain), rapidly increases as the absolute value of the strain increases. The increase is attributable to an increase in a valence band discontinuous quantity corresponding to a heavy hole in a $Ga_xIn_{1-x}As/Al_yIn_{1-y}As$ interface exposed to strain. That is, there will be an approximately 140meV increase in the valence band discontinuous quantity in a $Ga_xIn_{1-x}As$ or $Al_yIn_{1-y}As$ system with a compression strain of +1% supplied thereto.